

The Impact of COVID-19 on the Capital Structure of the Top 40 JSE-Listed Companies

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Abstract

A global crisis like the COVID-19 pandemic may strain liquidity and force companies to revisit their assumptions about the optimum capital structure. While numerous researchers have investigated the impact of COVID-19 on capital structure, most were conducted in developed countries, where systematic risk is lower and financing more accessible. This research seeks to bridge the gap by exploring the impact of COVID-19 on the capital structures of the Top 40 JSE-listed companies using data spanning 2018 to 2022. The study used fixed effects regression models to test the moderating effect of the pandemic on the relationship between specific economic factors and companies' short-term, long-term and overall gearing ratios. Contrary to expectations, the research found no significant relationship between COVID-19 and any of the capital structure ratios of the Top 40 JSE-listed companies. However, The analysis revealed that company-specific factors, including liquidity, profitability, growth, company size and tangibility, play a statistically significant role in understanding some of the variances in the overall, short-

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term, and long-term gearing levels of the Top 40 JSE-listed companies. This study contributes valuable insights into the dynamics of capital structure adjustments in the context of developing countries during a global crisis, shedding light on the resilience or stability exhibited by the Top 40 companies listed on the JSE in the face of the unprecedented challenges posed by the COVID-19 pandemic.

1. Introduction

1.1. Background

The unprecedented challenges brought on by the COVID-19 pandemic have significantly impacted economies worldwide. Businesses have grappled with the immediate effects of widespread lockdowns, including disruptions in supply chains and reduced consumer spending, which have posed threats to their short- and long-term sustainability (De Villiers, Cerbone, & Van Zijl, 2020).

A company's capital structure is critical in shaping investors' perceptions of its risk profile and overall financial well-being (Kumar, Colombage, & Rao, 2017). During times of crisis, decisions regarding the optimal mix of debt and equity to fund operations become more complex (Ahmed, Nugraha, & Hågen, 2024). On the one hand, companies tend to adopt more conservative financing approaches, such as reducing their reliance on debt, to hedge against increased systematic risk (Prakash, Maheshwari, & Hawaldar, 2022). Financial institutions are also more cautious about extending credit, making it challenging for companies to secure additional financing (Ahmed et al., 2024).

On the other hand, companies may find themselves compelled to take on more debt to address short-term liquidity challenges stemming from challenging economic conditions (Jasiniak & Rudzki, 2023). In South Africa, the task of maintaining an optimal capital structure is further magnified, as companies listed on the JSE face even greater volatility than their European and Asian counterparts (Chinzara, 2011).

1.2. Problem Statement

Several studies have investigated the impact of the pandemic on the capital structure of companies from a European (Edberg & Kjellander, 2022; Pasanen, 2023; Turkki, 2021; Yang, 2023), Asian (Mohd Azhari, Mahmud, & Shaharuddin, 2022; Prakash et al., 2022) and Middle Eastern (Ahmed et al., 2024; Almustafa, Nguyen, Liu, & Dang, 2023) perspectives. These studies reported mixed results. Within emerging economies, scholars such as Ahmed et al. (2024), Mohd Azhari et al. (2022), Pasanen (2023) and Prakash et al. (2022) found that companies reduced debt levels significantly

during and after the pandemic. In contrast, studies conducted in developed economies reported increased debt levels (Edberg & Kjellander, 2022; Turkki, 2021; Yang, 2023).

The impact of the COVID-19 crisis on the capital structures of African companies is largely unknown. Examining the influence of the COVID-19 pandemic on the capital structure of South African companies provides a unique angle into the phenomenon and the strategies adopted when navigating the challenges brought about by severe crises (Jasiniak & Rudzki, 2023). The results offer guidance to managers and investors about confronting similar events and the company-specific determinants of capital structure.

1.3. Research objectives

In response to the research problem, this study aimed to assess the influence of the COVID-19 pandemic on the capital structure of the Top 40 JSE-listed companies. The following research questions were addressed to achieve the study's overall aim:

- Did the outbreak of the COVID-19 pandemic significantly impact the overall, long-term and short-term capital structure of the Top40 JSE-listed companies?
- Do company-specific determinants, such as liquidity, profitability, tangibility, company size, and growth, significantly impact the overall, long-term and short-term capital structure of the Top40 JSE-listed companies?

The remainder of the paper is structured as follows:

First, the literature review section explores the existing research on the impact of COVID-19 on the availability of finance and capital structures in both developed and developing economies. The purpose is to identify patterns and trends to support the study's hypotheses. The following section justifies the research design and methods used to test the hypotheses. After that, the findings are presented, and the results are discussed and compared to the available literature. Finally, the conclusions, management implications, the study's limitations, and avenues for future research are presented.

2. Literature Review

Companies use a mixture of debt and equity to finance the assets needed for operations. This debt-to-equity ratio represents the company's capital structure (Kumar et al., 2017). Gearing, or leverage, involves using borrowed funds, such as debt, to finance investments or business operations. This approach allows businesses and individuals to amplify potential returns with borrowed money and exposes them to increased financial risk (Pasanen, 2023). Utilising debt enables companies to increase their leverage, potentially yielding higher returns on equity when investments or operations are successful (Kumar et al., 2017). However, debt can also magnify losses and elevate the risk of financial distress if the investments do not generate sufficient returns. A high debt-equity ratio

(gearing ratio) suggests significant debt relative to equity, indicating higher financial risk due to increased interest payments and vulnerability to economic downturns. Conversely, a low gearing ratio implies a conservative capital structure with less debt relative to equity (Kumar et al., 2017)

2.1. The Factors Influencing Capital Structure

Companies are generally advised to maintain a balanced and sustainable gearing ratio aligned with their long-term financial goals. Miller and Modigliani's (1958) theory argues that bankruptcy cost, agency cost, tax advantages and information asymmetry most notably impact capital structure (Yang, 2023; Zandbergen, 2023). Since then, several empirical studies have linked capital structure to the internal and external factors a company is subjected to (Kumar et al., 2017).

In this paper, we adopt the view followed by the existing literature that maintaining this balance requires considering company-specific factors like asset tangibility, size, profitability, growth and liquidity (Prakash et al., 2022; Zandbergen, 2023).

Table 1 sets out the findings of recent empirical studies that considered various company-specific capital structure determinants in various jurisdictions. These variables are those commonly used by studies investigating capital structure (Ahmed et al., 2024).

Table 1: Empirical results of company-specific factors commonly used to explain variations in capital structure.

Company-Specific Factor	Empirical consensus	Reference
Profitability	Mixed results, but a significant negative relationship is mainly reported.	(Ahmed et al., 2024; Kumar et al., 2017; Mohd Azhari et al., 2022; Prakash et al., 2022; Turkki, 2021; Zandbergen, 2023)
Growth	Mixed results, but a significant negative relationship is mainly reported.	(Ahmed et al., 2024; Kumar et al., 2017; Turkki, 2021; Zandbergen, 2023)
Tangibility	Mixed results, but a significant positive relationship is mainly reported.	(Ahmed et al., 2024; Kumar et al., 2017; Prakash et al., 2022; Turkki, 2021; Zandbergen, 2023)
Liquidity	Mixed results are reported.	(Ahmed et al., 2024; Kumar et al., 2017; Turkki, 2021; Zandbergen, 2023)

Size	Mixed results, but a significant negative relationship is mainly reported.	(Ahmed et al., 2024; Kumar et al., 2017; Turkki, 2021; Zandbergen, 2023)
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Source: Own compilation

This study used variables similar to those in the studies listed in Table 1 to control for the moderating effect of the pandemic on the changes in the capital structure of JSE-listed companies. Therefore, the following null hypotheses were tested:

H_{1a} - Company-specific factors (profitability, growth, tangibility, liquidity and size) have no significant impact on the overall capital structure of the Top 40 JSE Listed companies.

H_{1b} - Company-specific factors (profitability, growth, tangibility, liquidity and size) have no significant impact on the short-term capital structure of the Top 40 JSE-Listed companies.

H_{1c} - Company-specific factors (profitability, growth, tangibility, liquidity and size) have no significant impact on the long-term capital structure of the Top 40 JSE-Listed companies.

2.2. The Impact of COVID-19 on Financing and Capital Structure

A company's capital structure is not only influenced by company-specific factors but also by macroeconomic uncertainty (e.g. a pandemic) and institutional settings (e.g. the country or industry it operates in) (Graham, Leary, & Roberts, 2015). Studies investigating the impact of COVID-19 on the availability of finance and capital structure reported varied results across developed and developing economies.

2.2.1. The impact of COVID-19 on the availability of financing and company gearing in developed economies

Governments, including the United States, United Kingdom and Sweden, implemented extensive government support to alleviate the economic impact of the pandemic (Mazanec, 2023; Yang, 2023). These measures comprised direct financial assistance, loan guarantees, debt moratoriums and the introduction of monetary policies to stimulate the economy and reduce borrowing costs. For instance, by 2021, the UK had allocated £200 billion through various government schemes to provide companies with access to funds during COVID-19 (Yang, 2023). The Swedish government also provided state loan credit guarantees totalling SEK 100 billion to facilitate financing access, and the Swedish central bank offered SEK 500 billion in loans to companies at zero interest against collateral (Edberg & Kjellander, 2022).

As a result, most studies in developed economies reported increased financial gearing during the pandemic. Edberg and Kjellander (2022) found an average increase of 1.3% in leverage among

Swedish firms during the pandemic, with industries such as consumer goods and services more adversely affected than sectors like healthcare that did not experience the effects of lockdowns.

Similarly, Turkki (2021) concluded that European companies, primarily privately owned ones, have increased their leverage and long-term debt during 2020. In addition to an overall increase in short and long-term debt levels, Yang (2023) also reported a decline in European companies' profitability, solvency, and cash flow during the pandemic.

Interestingly, these results differ from the findings of studies conducted on the impact of the 2008 global financial crisis on economic uncertainty and capital structure (Alves & Francisco, 2015). During the financial crisis, companies drastically decreased their overall debt levels, mainly due to the limited availability of funds (Alves & Francisco, 2015).

2.2.2. The impact of COVID-19 on the availability of financing and the gearing of companies operating in developing economies

Developing countries often rely on foreign capital to fund their economic activities (OECD, 2020). Almustafa et al. (2023) reported that global investors became more risk-averse during the pandemic, increasing borrowing costs for countries carrying more systematic risk. This situation negatively impacted gearing as higher interest rates made it more expensive for companies to borrow and service their debt.

In addition, many developing countries experienced currency depreciation during the pandemic, which can further exacerbate the debt burden for companies. If a company has debt denominated in foreign currencies, the depreciation of the local currency can make it more expensive to repay the debt, leading to higher gearing ratios (Ozili, 2020).

Liquidity challenges: Developing countries faced liquidity challenges during the pandemic due to reduced economic activity and disruptions in global supply chains (OECD, 2020). Oil-producing developing countries witnessed a fall in oil prices and limited demand, with top-producing developing countries such as Nigeria, Angola and Iraq having a 50% to 85% drop in net income further, putting companies in these countries in financial need (OECD, 2020).

Studies investigating the impact of the COVID-19 pandemic on capital structures in developing economies were primarily conducted in Asia, the Middle East and North Africa.

In India, Prakash et al. (2022) found the pandemic had a significant, adverse effect on long-term gearing, while the impact on overall and short-term gearing was insignificant. The findings indicate that companies based in a culturally risk-averse environment, such as India, would reduce long-term debt to avoid bankruptcy in times of uncertainty (Prakash et al., 2022). South Africa has a less risk-averse culture (Gasela, 2022), and findings may differ in this setting.

In the Middle East, Mohd Azhari et al. (2022) did not find any empirical support that the COVID-19 pandemic affected the financial structure of non-financial listed companies in Gulf Cooperation Council (GCC) nations. Similarly, Ahmed et al. (2024) reported a decrease in overall gearing in the Middle Eastern and North African regions for all non-financial industries (excluding mining) during the pandemic. No significant relationships were, however, found between the COVID dummy variable and the short and long-term gearing during this time. The findings do not support the idea that companies use debt financing to overcome capital shortages after a crisis.

2.2.3. The impact of COVID-19 on the finance structures of JSE-listed companies

On 26 March 2020, the president of South Africa announced that lockdown measures would be implemented to combat the spread of the coronavirus (De Villiers et al., 2020). During the initial stages of the pandemic, global markets, including the JSE, witnessed substantial volatility and declining share prices (Asmal, Borat, Martin, & Rooney, 2023). The uncertainties and economic disruptions stemming from prolonged lockdown measures resulted in supply chain interruptions, reduced consumer spending, and travel restrictions, adversely affecting numerous industries (De Villiers et al., 2020).

A survey conducted by PWC (2022) during the pandemic revealed that 23.8% of companies anticipated a reduction in their ability to access funding, and more than half (53.7%) were unsure whether they would meet short-term obligations. Government interventions and economic stimulus measures, including relief packages and loan guarantees, were implemented to support businesses and alleviate the financial repercussions of the pandemic (KPMG, 2020). These measures assisted some companies in meeting their short-term financial obligations or sustaining their operations during the crisis (KPMG, 2020).

The study tested the following null hypotheses to determine the effect of the COVID-19 pandemic on the capital structures of South African companies:

H_{2a} – COVID-19 had no significant impact on the overall capital structure of the Top 40 JSE Listed companies.

H_{2b} - COVID-19 had no significant impact on the short-term capital structure of the Top 40 JSE-Listed companies.

H_{2c} - COVID-19 had no significant impact on the long-term capital structure of the Top 40 JSE-Listed companies

3. Research Methodology

This study was conducted from a positivistic paradigm and used quantitative data to test the hypotheses.

3.1. Data Collection

The study used secondary data for the Top 40 JSE-Listed companies from 2018 to 2022. The period of the study included two years before the start of the pandemic and the three years of the pandemic. The JSE Top 40 Index represents over 80% of the total market capitalisation of the JSE and, hence, is regarded as representative of corporate South Africa.

Data on all forty companies listed on the JSE Top 40 Index was collected from the IRESS financial database.

Table 2 shows the data collected and the variables tested. The total leverage ratio (TLR), the long-term leverage ratio (LTLR) and the short-term leverage ratio (STLR) were used as broad indicators of capital structure. Based on the previous empirical work (indicated in Table 1), the research identified growth, tangibility, size, profitability and liquidity as the factors impacting capital structure (Refer to Table 1). Because the level of capital structure of companies is assumed to have changed after the pandemic, the moderating role of COVID-19 in the relationship between the company-specific variables and capital structure is investigated. Covid-19 is therefore included as a dummy variable.

Table 2: Variables used for analysis

Variables	Units	Definition / Formula
Dependent Variables		
Total leverage ratio (TLR)	Ratio	Total debt/total assets
Short-term leverage ratio (STLR)	Ratio	Short-term debt/total assets
Long-term leverage ratio (LTLR)	Ratio	Long-term debt/total assets
Independent Variables		
Growth (GROWTH)	Ratio	Tobin's Q= Share Price/Book Value of Assets
Tangibility (TANG)	Ratio	Book Value of Property Plant and Equipment/Total Assets
Company size (SIZE)	INR (In)	Total assets
Profitability (PROF)	%	Return on Assets (Profit before interest after tax)/Total Assets
Liquidity (LIQ)	Ratio	Current Asset/Current Liabilities
Covid-19	Dummy	To differentiate between pre- and during the pandemic periods. A value of 0 was awarded for pre-pandemic periods and a value of 1 was awarded for pandemic periods.

Source: Own compilation

3.2. Data Analysis

Panel regression modelling was used to analyse the relationship between our dependent and independent variables. The method was chosen as it allows for both time series (2018 to 2022) and cross-sectional dimensions (company-specific factors) to be considered when examining variations in capital structures while moderating the effect of the COVID-19 pandemic.

To test the hypotheses, the following base models were specified:

$$STLR_{it} = \beta_0 + \beta_1 PROF_{it} + \beta_2 TANG_{it} + \beta_3 GROWTH_{it} + \beta_4 LIQ_{it} + \beta_5 SIZE_{it} + \beta_6 COVID_DUM_t + \epsilon_{it} \quad (1)$$

$$LTLR_{it} = \beta_0 + \beta_1 PROF_{it} + \beta_2 TANG_{it} + \beta_3 GROWTH_{it} + \beta_4 LIQ_{it} + \beta_5 SIZE_{it} + \beta_6 COVID_DUM_t + \epsilon_{it} \quad (2)$$

$$TLR_{it} = \beta_0 + \beta_1 PROF_{it} + \beta_2 TANG_{it} + \beta_3 GROWTH_{it} + \beta_4 LIQ_{it} + \beta_5 SIZE_{it} + \beta_6 COVID_DUM_t + \epsilon_{it} \quad (3)$$

Where i denotes the firm, t denotes the year, D_t represents the time-varying dummy variable, i.e. the COVID period, and ϵ is the error term.

This model was estimated using the Pooled Ordinary Least Square (POLS) regression model, the Fixed Effects (FE) and Random Effects (RE) model specifications.

The POLS regression model is the most straightforward approach to panel data analysis. It combines all the data and runs an ordinary least squares (OLS) regression, ignoring the time and individual dimensions of the data. A redundant fixed effects test was conducted to determine whether data could be pooled and estimated using a standard ordinary least squares regression model or whether a fixed effects and random effects panel regression approach must be employed (Brooks, 2019).

The FE Model allows for heterogeneity among entities by letting each entity have its own intercept value. It assumes that the individual company-specific effect is correlated with the independent variables while controlling for all time-invariant differences between the entities.

Random Effects Model can estimate the effects of time-invariant variables. It assumes that the individual company-specific effects are uncorrelated with the independent variables.

The Hausman test determined the most appropriate specification between fixed and random effects models. Additionally, independent variables were lagged by one year to address potential endogeneity concerns (Zeitun & Gang Tian, 2007).

All statistical analyses were performed using EViews (student edition) software. The built-in panel data analysis features, including its robust covariance estimation methods, were applied to account for potential heteroskedasticity and serial correlation in the error terms.

3.3. Ethics

The secondary data used in this research consisted of audited financial statements disseminated by the companies and available to the general public. The ethical risks associated with the study are negligent because secondary, non-sensitive data, freely available in the public domain, is used.

The study was submitted for clearance to the university's ethical committee, where it was conducted. The following ethical clearance number was awarded: SAREC20230726/02.

4. Results and Findings

The results of the panel regression models that test the impact of company-specific factors and the COVID-19 pandemic on each of the capital structure ratios, i.e., the total leverage ratio (TLR), the short-term leverage ratio (STLR) and the long-term leverage ratio (LTLR), are presented in this section. The redundant fixed effect and Hausman test were conducted for each regression model to determine whether POLS, fixed effect or random effects estimation models were required.

The redundant fixed effect model tests the null hypothesis that the fixed effects are redundant (i.e., the POLS model is adequate). Table 1 shows the output of each leverage model's redundant fixed effect test.

Table 3: Redundant Fixed effect model results for the three dependent variables

	TLR		STLR		LTLR	
	Effects test	<i>p</i> -value	Effects test	<i>p</i> -value	Effects test	<i>p</i> -value
Cross section F	44.71845	0.000***	41.07771	0.000***	115.5885	0.000***
Chi-square	502.32273	0.000***	486.7717	0.000***	682.0473	0.000***
	6					

*** $p < 0.01$

Source: Compiled from E-views output

Both the F-statistic and Chi-square statistic have *p*-values of 0.000 for all models. The hypotheses are therefore rejected, and it is concluded that fixed effects are significant and should be included in the model.

Table 4 shows the output of the Hausman test for each model. The null hypothesis of the Hausman test is that the fixed effect model is the appropriate model to analyse the data.

Table 4: Hausman test output for the three dependent variables

	TLR		STLR		LTLR	
	Effects test	<i>p</i> -value	Effects test	<i>p</i> -value	Effects test	<i>p</i> -value
Chi-square	56.69302	0.000***	51.59891	0.000***	25.219266	0.000***
R ² - fixed	0.926438		0.937802		0.972095	

R ² - random	0.139402		0.063401		0.20176	
Final model	Fixed effect		Fixed effect		Fixed effect	

*** $p < 0.01$

Source: Compiled from E-views output

Based on the results of the Hausman test presented in Table 4, the fixed effect estimation models are preferred for all the proposed leverage models. These results of the fixed effect estimation models for the TLR, STLR and LTLR dependent variables are shown in Table 5.

Table 5: Results from the fixed effect estimation models

	TLR	STLR	LTLR
Independent Variables	Coefficient (<i>p-value</i>)	Coefficient (<i>p-value</i>)	Coefficient (<i>p-value</i>)
Constant	0.2101 (0.000)***	0.2588 (0.000)***	0.6822 (0.000)***
LIQUIDITY	-0.0084 (0.1527)	0.2588 (0.001)***	-0.0269 (0.0055)***
PROFITABILITY (ROA)	-0.0109 (0.000)***	-0.0151 (0.0762)*	0.0189 (0.000)***
TANGIBILITY	0.3258 (0.001)***	0.0023 (0.0288)**	0.0235 (0.8784)
SIZE	3.73E-11 (0.3425)	-0.1535 (0.000)***	2.56E-10 (0.0001)***
GROWTH (TOBIN'S Q)	-0.1189 (0.000)***	1.85E-10 (0.2645)	-0.1846 (0.000)***
DUM (COVID)	-0.007 (0.8835)	0.0186 (0.8775)	-0.0070 (0.9238)
Diagnostic test and model fit statistics			
R2	0.298	0.2908	0.307
Adjusted R ²	0.277	0.269	0.285
Durbin-Watson	1.178124	1.774397	0.99657
F-statistic	56.69302 (0.000)***	51.5989 (0.000)***	145.989 (0.000)***

Standard coefficients (p-values) ***, ** and * are significant at 1%, 5% and 10% respectively.

Source: Compiled from E-views output

Table 5 shows the fixed effect models explain a large portion of the variance in TLR (29.8%), STLR (29.0%) and LTLR (30.7%). The r^2 values are similar to those of other studies and used panel regressions to estimate the impact of COVID-19 on capital structures (Ahmed et al., 2024; Jasiniak & Rudzki, 2023; Prakash et al., 2022). The F-statistics of all three models show low probability levels ($p = 0.000$), indicating that the models are statistically significant.

4.1. Discussion of the results

First, the results show that the COVID-19 pandemic did not significantly impact the capital structure ratios of the Top 40 JSE-listed companies. The result contradicts the findings of studies conducted elsewhere in the world, indicating that companies changed their capital structures significantly during and after the COVID-19 pandemic (Ahmed et al., 2024; Edberg & Kjellander, 2022; Jasiniak & Rudzki, 2023; Mohd Azhari et al., 2022; Mouton & Pelcher, 2023). A possible reason for the contradictory findings is that most of the companies included in the JSE Top 40 list operate in the basic minerals and financial sectors, where the financial impact of the COVID pandemic may not have been as severe as in other sectors, such as consumer services (Mouton & Pelcher, 2023; Yang, 2023). Pasanen (2023) found that the capital structure of Indian mining companies did not change significantly due to the pandemic.

Second, all the company-specific determinants included in the models were found to have a significant relationship with one or more of the capital structure ratios. As anticipated, liquidity has a significant positive impact on the STLR, i.e., as companies' current assets ratio increases, the level of short-term debt financing also increases. The finding agrees with Jasiniak and Rudzki (2023), supporting the matching principle theory, which suggests that companies prefer to finance current assets using short-term debt, such as accounts receivable (Kwenda & Holden, 2014). Higher liquidity is further associated with lower long-term leverage, indicating that firms with more liquid assets may prefer internal financing through equity over long-term debt, in line with the pecking order theory (Pasanen, 2023).

The results show that all leverage ratios are positively affected by tangibility, which measures the ratio of fixed assets to total assets. These results are similar to those of Ahmed et al. (2024), Mouton and Pelcher (2023), Edberg and Kjellander (2022) and Yang (2023). The findings are also consistent with previous literature that suggests tangible assets can serve as collateral and reduce the perceived risk of lenders, thereby increasing the likelihood of obtaining debt financing (Pasanen, 2023).

As expected, profitability, measured through return on assets (ROA), has a significant negative impact on the short-term leverage ratio and a significant negative impact on the long-term leverage ratio of companies. In other words, less profitable companies make more use of short-term financing and companies with higher profitability finance their assets using higher levels of long-term financing. According to the signalling theory, financiers may perceive companies with lower profitability to

carry higher risk, resulting in such companies finding it difficult to secure long-term financing (Turkki, 2021). The results further show that profitability significantly and negatively impacts overall debt levels (TLR), supporting the pecking order theory, which argues that profitable firms have lower debt levels. The reason is that profit-generating companies are more likely to use internal funds to finance their operations than those with lower profitability (Pasanen, 2023).

Finance theory postulates that firms with high growth opportunities should have a lower debt level because of agency costs between debt holders that cause high financial distress costs (Meyers, 1977). Empirical studies, such as Prakash et al. (2022), Jasiniak and Rudzki (2023) and Zandbergen (2023), have also found evidence supporting the negative correlation between growth opportunities and leverage. Similarly, this study found negative relationships between growth and all the capital structure ratios. The impact is, however, only significant in terms of the total leverage and long-term leverage ratios.

The findings further indicate that a company's size has a significantly positive impact on the long-term leverage ratio (LTLR), a significantly negative impact on the short-term leverage ratio (STLR), and no significant impact on the total leverage ratio (TLR) of the Top 40 JSE-listed companies. Therefore, bigger companies tend to rely more on long-term borrowing, whereas smaller companies rely on short-term debt. The reason may be that larger companies have easier access to debt markets, a greater demand for funding to support future investments, or an intention to take advantage of tax shields (Turkki, 2021).

4.2. Summary of results

Based on the results discussed, the paper concludes on the hypotheses, which tested the impact of the company-specific determinants on the capital structure, as indicated in Table 6. (Where coefficients have a significant p -value, the null hypothesis is rejected.)

Table 6: Conclusion on the null hypotheses relating to the company-specific determinants of capital structure

Company-specific variable	Liquidity	Profitability	Tangibility	Size	Growth
Hypotheses					
<i>H_{1a} - Company-specific factors do not significantly impact the overall capital structure (TLR) of the Top 40 JSE-listed companies.</i>	Fail to reject	Reject	Reject	Fail to reject	Reject
<i>H_{1b} - Company-specific factors do not significantly impact the</i>	Reject	Reject	Reject	Reject	Fail to

<i>short-term capital structure (STLR) of the Top 40 JSE-Listed companies.</i>					reject
<i>H_{1c} - Company-specific factors do not significantly impact the long-term capital structure of the Top 40 JSE-Listed companies.</i>	Reject	Reject	Fail to reject	Reject	Reject

Source: Own compilation

Table 7 shows the study's conclusions on the null hypotheses, which tested the impact of COVID-19 on the capital structure of the Top 40 JSE-listed companies.

Table 7: Conclusion on the null hypotheses relating to the impact of COVID-19 on the capital structure

Hypotheses	Conclusion
<i>H_{2a} – COVID-19 do not significantly impact the overall capital structure of the Top 40 JSE Listed companies.</i>	Fail to reject
<i>H_{2b} - COVID-19 do not significantly impact the short-term capital structure of the Top 40 JSE-Listed companies.</i>	Fail to reject
<i>H_{2c} - COVID-19 do not significantly impact the long-term capital structure of the Top 40 JSE-Listed companies</i>	Fail to reject

Source: Own compilation

5. Managerial Implications

This study's results show no significant relationship between the COVID-19 Dummy variable and the dependent variable, implying that the pandemic may not have significantly influenced the gearing of the top 40 JSE-listed companies within the specified timeframe. However, managers and investors should remain cautious about generalising this finding across industries and all economic disruptions (Mouton & Pelcher, 2023; Pasanen, 2023; Turkki, 2021).

Despite the lack of evidence supporting the impact of COVID-19 on the Top 40 JSE-listed companies, the study provides a framework for the company-specific factors managers should consider when making decisions about a company's capital structure. Given the high systematic risk associated with South African markets (Chinzara, 2011), understanding how factors, such as liquidity, profitability, or tangible assets, influence leverage can help managers and investors assess the financial risk of different companies.

The significant relationship between profitability (ROA) and all leverage ratios implies that these ratios are a key factor in capital structure decisions. Managers of highly profitable firms might consider relying more on internal financing and less on debt to optimise their capital structure. Similarly, high-growth firms should prefer equity financing or retained earnings over debt to maintain financial flexibility for future investments. The significant impact of liquidity on STLR and LTLR suggests that companies should consider maintaining higher liquidity to reduce dependence on long-term debt and increase financial flexibility. The strong influence of tangibility on TLR and STLR indicates that firms with more tangible assets tend to have higher leverage. Managers could consider the composition of their asset base when making financing decisions, as tangible assets can serve as collateral for debt.

In addition, investors are advised to incorporate the factors underlying leverage ratios into valuation models to allow a more comprehensive analysis when making investment decisions.

6. Conclusions, Limitations and Future Research

The study set out to determine the impact of COVID-19 on the capital structure of the Top 40 JSE-listed companies by answering the following research questions:

- Did the outbreak of the COVID-19 pandemic significantly impact the overall, long-term and short-term capital structure of the Top40 JSE-listed companies?
- Do company-specific determinants, such as liquidity, profitability, tangibility, company size, and growth, significantly impact the overall, long-term and short-term capital structure of the Top40 JSE-listed companies?

While the study did not find any significant relationship between COVID-19, the analysis revealed that all company-specific factors play a statistically significant role in understanding some of the variances in the overall, short-term, and long-term gearing levels of the Top 40 JSE-listed companies.

Regarding the overall gearing levels (TLR), company growth and profitability (ROA) have a statistically negative impact, meaning that companies with higher growth rates and profitability have lower overall debt levels. The model further shows a significantly positive relationship between the % of tangible assets and the total leverage ratio. This finding is expected as companies typically use debt to finance tangible assets (property, plant and equipment). The study found no statistically significant relationship between the size of the company, its liquidity ratio and overall debt levels.

The results of the STLR model show that liquidity and tangibility have a strong and positive effect on short-term leverage. The company's size and profitability significantly negatively impact the level of current assets used for financing the business, i.e., smaller companies with lower profitability make more extensive use of short-term financing than larger, more profitable ones. Growth was the only variable found not to impact short-term leverage.

When considering the long-term leverage (LTL) of the Top 40 JSE-listed companies, liquidity and growth were found to have a significantly negative impact. In contrast, size and profitability have a significantly positive impact.

6.1. Limitations and suggestions and further research

According to Turkki (2021), empirical modelling of the determinants of companies' capital structures is subject to a set of problems, both present in this study. Firstly, models generally have weak explanatory power (measured by R^2), meaning there is still a lot of unexplained variation in capital structure that is not explained by the models presented in this study ($r^2 > 0.31$). Future studies may consider a more comprehensive range of company-specific variables, such as cash flow ratios and industry, or microeconomic variables, such as GDP, inflation and interest rates.

Secondly, data is often insufficient, incomplete, and suffers from different biases. The Top 40 JSE-listed company index consists primarily of companies in the mining and financial sectors. This bias may have resulted in the study finding no evidence of the COVID-19 pandemic influencing the gearing ratios (Mouton & Pelcher, 2023). Further studies could include a larger sample of South African companies to allow for the comparison of the influence of the pandemic on various industries.

Thirdly, the study's data set ends in 2022. Future studies could include periods after COVID-19 to determine whether the pandemic had longer-term implications on the capital structures of JSE-listed companies.

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REFERENCES

- Ahmed, A. M., Nugraha, D. P., & Hågen, I. (2024). Assessing the Impact of COVID-19 on Capital Structure Dynamics: Evidence from GCC Economies. *Economies*, 12(5). <https://doi.org/10.3390/economies12050103>
- Almustafa, H., Nguyen, Q. K., Liu, J., & Dang, V. C. (2023). The impact of COVID-19 on firm risk and performance in MENA countries: Does national governance quality matter? *PLoS One*, 18(2). <https://doi.org/10.1371/journal.pone.0281148>
- Alves, P., & Francisco, P. (2015). The impact of institutional environment on the capital structure of firms during recent financial crises. *The Quarterly Review of Economics and Finance*, 57, 129-146. <https://doi.org/10.1016/j.qref.2014.12.001>
- Asmal, Z., Bhorat, H., Martin, L.-C., & Rooney, C. (2023). *Technology changes in the insurance sector in South Africa*.
- Brooks, C. (2019). *Introductory Econometrics for Finance*. Cambridge University Press.

- Chinzara, Z. (2011). Macroeconomic Uncertainty and Conditional Stock Market Volatility in South Africa. *South African Journal of Economics*, 79(1), 27-49. <https://doi.org/10.1111/j.1813-6982.2011.01262.x>
- De Villiers, C., Cerbone, D., & Van Zijl, W. (2020). The South African government's response to COVID-19. *Journal of Public Budgeting, Accounting & Financial Management*, 32(5), 797-811. <https://doi.org/10.1108/jpbafm-07-2020-0120>
- Edberg, C., & Kjellander, O. (2022). *The Impact of COVID-19 on Corporate Capital Structure: An empirical evaluation on the pandemic in a Swedish context* [Linnaeus University].
- Graham, J. R., Leary, M. T., & Roberts, M. R. (2015). A century of capital structure: The leveraging of corporate America. *Journal of Financial Economics*, 118(3), 658-683. <https://doi.org/10.1016/j.jfineco.2014.08.005>
- Jasiniak, M., & Rudzki, M. (2023). Impact of Capital Structure on the Company's Financial Situation during the Pandemic—Analysis Based on Examples of Listed Companies. *Finanse i Prawo Finansowe*, 3(39), 15-29.
- KPMG. (2020). *International Development Assistance: Supporting COVID-19 response*. <https://kpmg.com/xx/en/home/industries/government-public-sector/international-development-services/supporting-covid-19-response.html>
- Kumar, S., Colombage, S., & Rao, P. (2017). Research on capital structure determinants: a review and future directions. *International Journal of Managerial Finance*, 13(2), 106-132. <https://doi.org/10.1108/ijmf-09-2014-0135>
- Kwenda, F., & Holden, M. (2014). A dynamic perspective on determinants of short-term debt financing. *The Journal of Applied Business Research*, 30(1), 183-196.
- Mazanec, J. (2023). Capital Structure and Corporate Performance: An Empirical Analysis from Central Europe. *Mathematics*, 11(9). <https://doi.org/10.3390/math11092095>
- Mohd Azhari, N. K., Mahmud, R., & Shaharuddin, S. N. H. (2022). Capital Structure of Malaysian Companies: Are They Different During the COVID-19 Pandemic? *The Journal of Asian Finance, Economics and Business*, 9(4), 239-250. <https://doi.org/10.13106/jafeb.2022.vol9.no4.0239>
- Mouton, M., & Pelcher, L. (2023). Capital structure and COVID-19: Lessons learned from an emerging market. *Acta Commercii*, 23(1). <https://doi.org/10.4102/ac.v23i1.1125>
- OECD. (2020). *OECD Policy Responses to Coronavirus (COVID-19)*. <https://www.oecd.org/coronavirus/policy-responses/insolvency-and-debt-overhang-following-the-covid-19-outbreak-assessment-of-risks-and-policy-responses>.
- Ozili, P. K. (2020). COVID-19 in Africa, socio-economic impact, policy response and opportunities. *International Journal of Sociology and Social Press*, 1(1), 40-65.
- Pasanen, E. (2023). *Capital structure adjustments during the COVID-19 pandemic: evidence from eight industries* [Tallinn University of Technology]. Tallinn.

- Prakash, N., Maheshwari, A., & Hawaldar, A. (2022). The impact of Covid-19 on the capital structure in emerging economies: evidence from India. *Asian Journal of Accounting Research*, 8(3), 236-249. <https://doi.org/10.1108/ajar-05-2022-0144>
- PWC. (2022). *Impact of trade disrupting COVID-19 on SA-business*. <https://www.pwc.co.za/en/assets/pdf/impact-of-trade-disrupting-covid-19-on-sa-business.pdf>
- Turkki, T. (2021). *The effects of COVID-19 on the capital structure of European companies* [Alto University]. Business School.
- Yang, C. (2023). *Impact of Covid-19 on the capital structure of UK firms* [University of Glasgow]. <https://dx.doi.org/10.5525/gla.thesis.83727>
- Zandbergen, M. (2023). *The effect of the COVID-19 pandemic on the capital structure and on its relation towards firm profitability and firm value* [Erasmus Universtiy Rotterdam]. Rotterdam.
- Zeitun, R., & Gang Tian, G. (2007). Does ownership affect a firm's performance and default risk in Jordan? *Corporate Governance: The international journal of business in society*, 7(1), 66-82. <https://doi.org/10.1108/14720700710727122>